

Clear skies give the opportunity to view a variety of aircraft at the Air Show at Ellington Field. Photos on Page 4.

# Space News Roundup

Vol. 34 October 27, 1995 No. 43

## Atlantis returns to Mir space station next month

By Karen Schmidt

On the heels of STS-73, *Atlantis* and her crew of five will liftoff on STS-74 from Kennedy Space Center in early November to return to the Russian Mir Space Station.

"We have made great strides in learning to work with the Russians, and they with us," said Frank Cullbertson, Phase One program manager during a briefing held last week. "We have learned a lot about each other's culture, a lot about each other's way of doing engineering and a lot about each other's management of technical programs."

STS-74 will deliver a permanent docking

module to Mir. The Russian-built module, will be permanently affixed to Mir's Kristall science module. This will provide a permanent docking station and reduce reconfiguration efforts by Mir's cosmonauts for future shuttle visits.

During the first day in orbit, Commander Ken Cameron and Pilot Jim Halsell will power the module through an external electrical umbilical cable to provide active thermal control and other functions. On the day before

docking, Mission Specialist Chris Hadfield will



to prepare the module for docking with Mir. Once the module is in place, Cameron will

maneuver the Remote Manipulator Arm and grapple the module. Hadfield will berth the module on *Atlantis*' orbiter docking system, within the shuttle's payload bay. Once the module and the docking system are connected, the crew—including Mission Specialists Jerry Ross and Bill McArthur—will conduct pressure checks and reestablish electrical connections. After testing, the crew will open the hatches

perform several orbiter maneuvers to place *Atlantis* within docking distance to Mir. At 3000 feet within Mir, Mir 20 cosmonauts Commander Yuri Gidzenko, Flight Engineer Sergei Avdeyev and European Space Agency's German cosmonaut Thomas Reiter will align the Mir to allow *Atlantis* to dock.

Once docked, the two crews will conduct three days of scientific operations and resupply Mir with water, food and experiments.

Piggy-backing on the new docking module are solar arrays that will become a permanent part of Mir to increase power supply and test actual station configurations.

## Film library moves onsite to Bldg. 423

The JSC Film/Video Distribution Library currently located on Bay Area Blvd. will be moving on-site this month to Bldg. 423 and the Still Photo Library will soon join the FVDL.

"This move does two things," said Jeff Carr, acting director of the Office of Public Affairs. "It brings greater efficiency to both operations through consolidation and refinement of our customer support processes. We will be able to provide one-stop shopping for our customers. It also creates the opportunity to save off-site lease and utility costs."

The FVDL move will take place on Nov. 13. In order to accomplish this task the FVDL will be closed from Oct. 30 to Nov. 27. Orders received during these four weeks will be filled once operations resume.

STS-73 and STS-74 products for customers will be distributed from Bldg. 2 while the FVDL is closed.

In addition to the FVDL, the Still Photo Library will be moving from Bldg. 2 to Bldg. 423 in December or early January. The SPL will also close for a few weeks in December and early January. Exact dates will be announced.

The FVDL and the SPL provide film, video and still photography describing highlights of space missions and other NASA related imagery. Loans are available to the news media and to educational, civic, industrial, professional and other government organizations.

The FVDL currently stocks more than 40,000 films and video products dating back to the beginning of the space program viewed by more than 1.5 million people in any given month. Both libraries offer limited research support and are operated by Media Services Corp.

Procedures for off-site customer access are being finalized and will be published at a later date. The new facility will be called the JSC Media Resource Center. For more information call x34231.



NASA Photo

Payload Commander Kathy Thornton, left, and Payload Specialist Albert Sacco work in the Spacelab module performing experiments to gain new insights into a variety of scientific disciplines including fluid physics, materials science, biotechnology and combustion science.

## Engineers test Galileo's recorder

Engineers transmitted a series of commands to Jupiter-bound Galileo spacecraft last Friday in an effort to assess the state of its balky onboard tape recorder even though scientists say the mission can continue and achieve all its primary objectives.

The tape recorder, which is used mainly for onboard storage of imaging and spectral data from Galileo's instruments, apparently malfunctioned Oct. 11. The problem was detected shortly after Galileo, due to reach Jupiter on Dec. 7, took three images

through different filters to produce a color image of Jupiter and its moons. The tape recorder failed to stop rewinding as expected. Commands were sent to halt the recorder, that has remained on standby.

"For the past week, we've looked at both data from the spacecraft and from an identical tape recorder in the testbed laboratory here," said Galileo Project Manager William O'Neil at the Jet Propulsion Laboratory. "We've identified a number of mechanical

Please see **SCIENTISTS**, Page 4

## USML research on schedule

By James Hartsfield

Early morning clouds at the Kennedy Space Center cleared last Friday as the countdown clock ticked, allowing *Columbia* to launch at 8:53 a.m. JSC time on STS-73, a 16-day mission exploring the resource of weightlessness in the United States Microgravity Laboratory-2.

*Columbia* has performed almost flawlessly since reaching orbit, with only minor problems and none that have interrupted the around-the-clock research work under way. Shuttle managers said the several delays experienced with STS-73's launch were prudent to ensure that the spacecraft would be healthy for its 16-day orbital stay.

"We're really not interested in doing anything that bends the rules to the point... where people are uncomfortable. That's just not part of the vocabulary these days," Launch Integration Manager Loren Shriver said after liftoff. "I don't feel pressure to go launch. I want to conduct a safe program that launches by well thought-out rules."

Shriver added that the launch team's efforts at KSC in dealing with delays had been "super-human."

*Columbia* did encounter an overheating of one of three auxiliary power units, generators that supply power to the spacecraft's hydraulics, just after reaching orbit, and Pilot Kent Rominger shut the APU down a minute earlier than planned. Flight controllers, however, believe the problem was caused by a freezing of the APU's cooling system and that the system will be thawed by the time the unit is needed prior to landing.

By mid-day Friday, the USML-2 Spacelab was powered up and Red Team crew members—Commander Ken Bowersox, Rominger, Payload Commander Kathy Thornton and Payload Specialist Al Sacco—were already beginning experiments. The Red Team is keeping hours that roughly coincide with a daytime shift in Houston while the Blue Team—Mission Specialist Mike Lopez-Alegria and Cady Coleman and Payload Specialist Fred Leslie—

keeps what amounts to night hours. Investigations in more than 14 different areas of research, ranging from the behavior of fluids in weightlessness to crystal growth to the growth of plants, are now under way. Problems encountered during the work have been minimal and the research has remained on track as the mission approaches its midway point. The flight has been a trouble-free preview of how life is predicted to be aboard the space station.

*Columbia* also is equipped with several new items that allow expanded communications capabilities between the shuttle and the ground. Hi-Pack television, a system that allows as many as six channels of television to be sent to the ground simultaneously, has been in use almost continuously. The system and the

mission's progress thus far have delighted scientists at Marshall Space Flight Center's Spacelab Operations Control Center with constant views of ongoing experiments.

"This mission is a beautiful example of interactive science due to the collaborative efforts between the principal investigators, the ground controllers and the crew," said Mission Scientist Marcus Vlasse.

Another new capability being tested on STS-73 is the transmission of television from the ground to the crew. The ground-to-air television system may provide an enhanced capability for flight controllers to explain problems to crew members, as well as the morale boost of video conferences with families during long flights or on the station. Tests of the system so far during the flight have proven successful. During a two-way video conference between Capcom Tom Jones in Mission Control and *Columbia*, Bowersox reported the shuttle was in excellent shape.

"Sometimes on the ground people may say things about *Columbia*, about it being jinxed and having a lot of problems, but you wouldn't know it from our point of view here in orbit," he said. "She's just a super spaceship."

## Health plan open season begins

The 1995 open season for enrolling in or changing health plans under the Federal Employees Health Benefits Program begins Nov. 13 and continues through Dec. 11.

During this open season period, employees may change health plans, add or remove dependent coverage or enroll for the first time.

The annual Health Fair will be held from 9:30 a.m.-2:30 p.m. Nov. 15 at the Gilruth Center. Plan representatives will be available to discuss plan benefits and options with interested employees. Changes made during the open enrollment period become effective Jan. 9.

For additional information, contact Employee Services at x32681.

## Lawrence to remain in states

By Kyle Herring

Astronaut Wendy Lawrence, previously assigned to begin one year of training in Russia as backup to astronaut John Blaha, will remain in the United States after a determination was made that she did not meet the minimum height requirements to safely fit in a Soyuz descent vehicle.

Earlier this month, astronaut Scott Parazynski discontinued his Mir training when sitting height parameters raised concerns over his ability to fit safely in the Soyuz capsule. Lawrence was to begin her training in Russia in early October but remained in Houston

as discussions about possible flexibility in the height requirements continued between U.S. and Russian space flight experts.

Shuttle managers have reviewed all the astronauts currently assigned or under consideration to be assigned to a Mir flight and are satisfied that the crew members scheduled to fly on board Mir are well within the physical requirements for the Soyuz capsule.

"Both Scott and Wendy are now eligible for assignment to a shuttle flight," said David Leestma, director of Flight Crew Operations. Replacements for both Parazynski and Lawrence will be named shortly.



Wendy Lawrence

JSC

# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

**Houston Rockets Basketball:** Houston Rockets vs. Minnesota Timberwolves 7:30 p.m. Nov. 11 at the Summit. Tickets cost \$16.50 and \$22.50.

**Texas Renaissance Festival:** Sept. 30-Nov. 12. Tickets cost \$10.50 for adults and \$5.25 for children 5-12.

**Texas Renaissance Festival Bus Trip:** Nov. 11. Tickets cost \$17 for adults and \$12 for children 5-12.

**Deep Sea Fishing:** Nov. 5. Fishing tickets cost \$40 for adult and \$20 for children. Ride tickets cost \$20 for adults and children under 12 free.

**Wurstfest:** Nov. 4. Tickets cost \$17 for adults and \$12 for children. Children 12 and under free.

**University of Houston vs. University of Texas football:** Nov. 11, Astrodome, \$15.50.

**Houston Aeros Hockey:** Houston Aeros vs. Atlanta Knights at 7 p.m. Nov. 17 in the Summit. Tickets cost \$12.50.

**Sea World:** Tickets cost \$23.50 for adults and \$16.25 for children 3-11.

**Space Center Houston:** Discount tickets, adult, \$8.75; child (3-11), \$7.10.

**Metro tickets:** Passes, books and single tickets available.

**Movie discounts:** General Cinema, \$4.75; AMC Theater, \$4; Sony Loew's Theater, \$4.75.

**Stamps:** Book of 20, \$6.40.

**JSC history:** *Suddenly, Tomorrow Came: A History of the Johnson Space Center.* Cost is \$11.

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# Gilruth Center News

**Sign up policy:** All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

**EAA badges:** Dependents and spouses may apply for photo identification badges from 7 a.m.-9 p.m. Monday-Friday; and 8 a.m.-4 p.m. Saturdays. Dependents must be between 16 and 23 years old.

**Winter softball league:** Teams interested in playing call the Gilruth at x33345.

**Women's self defense workshop:** 5 p.m. Nov. 1. Free admission. Call x30304 for reservations.

**Intercenter run:** continues through October. Sign up sheets for 2-mile and 10K runs available. T-shirts orders also are being taken. Cost for shirts is \$2.

**Aerobics:** Classes meet 5:15-6:15 p.m. Tuesday, Thursday and Friday and 9:30-11 a.m. Saturdays. Cost is \$35 for 11 weeks.

**Women's self defense:** Martial Arts training for women only from 5-6 p.m. Tuesdays and Wednesdays. Cost is \$25 a month.

**Weight safety:** Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Nov. 14 and Nov. 30. Pre-registration is required. Cost is \$5.

**Exercise:** Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays.

**Aikido:** Martial arts class meets from 5-7 p.m. Wednesday. Cost is \$25 per month. New classes begin the first of each month.

**Ballroom dancing:** Cost is \$60 per couple. For additional information call the Gilruth Center at x33345.

**Country and Western dancing:** Beginner class meets 7-8:30 p.m. Monday. Advance class meets 8:30-10 p.m. Monday. Cost is \$20 per couple.

**Fitness program:** Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Wier at x30301.

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# Dates & Data

## Today

**Chili cookoff:** Center Operations will hold its annual chili cookoff at 4 p.m. Oct. 27 at the Gilruth Center. Tickets cost \$5. For more information call Ginger Gibson at x30596.

**Cafeteria menu — Special:** tuna noodle casserole. Total Health: broiled chicken breast. Entrees: deviled crabs, broiled pollock, liver and onions, broiled chicken with peach half, Reuben sandwich. Soup: seafood gumbo. Vegetables: Italian green beans, cauliflower au gratin, steamed rice, vegetable sticks.

## Saturday

**Halloween dance:** The JSC Employee Activities Association's annual Halloween dinner/dance will be at 7:30 p.m. Oct. 28 at the Gilruth Center. Tickets are \$15 per person. For additional information contact Mavis Ilkenhans, 244-9644.

**Star gazing:** The JSC Astronomical Society invite the public to view the autumn skies through telescopes from dusk till 10 p.m. Oct. 28 at Challenger 7 Memorial Park. For more information call Bill Williams 339-1367.

## Monday

**Cafeteria menu — Special:** Italian cutlet. Total Health: herb flavored steamed pollock. Entrees: barbecue beef spare ribs, steamed pollock, baked chicken. French dip sandwich. Soup: black bean and rice. Vegetables: California mix, okra and tomatoes, vegetable sticks, ranch style beans.

## Tuesday

**Cafeteria menu — Special:** spaghetti with meatballs. Total Health: baked potato. Entrees: stir fry beef, liver and onions, beef cannelloni, ham steak French dip sandwich. Soup: split pea. Vegetables:

winter blend mix, seasoned cabbage, breaded squash, lima beans.

## Wednesday

**Toastmasters meet:** The Space-land Toastmasters will meet at 7 a.m. Nov. 1 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

**Astronomy seminar:** The JSC Astronomy Seminar will meet at noon Nov. 1 in Bldg. 31, Rm. 129. An open discussion meeting is planned. For more information, call Al Jackson at 333-7679.

**Cycle club:** The Space City Cycle Club will meet for a 25-mile ride beginning at 6 p.m. Nov. 1 at the University of Houston Clear Lake soccer field. For more information on this ride and weekend rides call Mike Prendergast at x45164.

**Cafeteria menu — Special:** smoked barbecue link. Total Health: roast pork loin. Entrees: cheese enchiladas, roast pork and dressing, baked chicken, steamed pollock, Reuben sandwich. Soup: seafood gumbo. Vegetables: Italian green beans, Spanish rice, turnip greens, peas and carrots.

## Thursday

**Cafeteria menu — Special:** chicken fried steak. Total Health: roast beef with gravy. Entrees: steamed pollock, lasagna with meat, steamed pollock, catfish, French dip sandwich. Soup: cream of turkey. Vegetables: whole green beans, butter squash, cut corn, black-eyed peas.

## Friday

**Small business expo:** Small, disadvantaged, and women-owned businesses may discuss their companies' capabilities with JSC's technical and procurement organiza-

tions, as well as major support contractors at an upcoming Small Business Expo to be held from 9 a.m.-2 p.m. Nov. 3 at the Gilruth Center. The free expo will offer briefings including ISO 9000—The NASA Plan; Mentor-Protege Pilot Program; Doing Business with NASA; Setting Up a Basic Accounting System for Government Contracting; and an Introduction to Internet—The New Path to NASA Procurements. For more information, contact Barbara Kirkland at X34512.

**Cafeteria menu — Special:** fried chicken. Total Health: vegetable lasagna. Entrees: pollock hollandaise, beef stroganoff, vegetable lasagna. Vegetables: steamed broccoli, carrots vichy, Italian zucchini, breaded okra.

## Nov. 7

**ABWA meet:** The Clear Lake Area Chapter of the American Business Women's Association will meet at 5:30 p.m. Nov. 7 at Space Center Houston's Silver Moon Cafe. A Christmas auction will be held to benefit the chapter's scholarship fund. Justice of the Peace Steve Phelps will serve as auctioneer. Tickets cost \$10 and include dinner. For more information Nancy Gabriel 486-7840 or Cyndi Draughon 996-9058 for reservations.

## Nov. 8

**Toastmasters meet:** The Space-land Toastmasters will meet at 7 a.m. Nov. 8 at House of Prayer Lutheran Church on Bay Area Blvd. For additional information, contact Elaine Trainor, x31034.

**MAES meets:** The Society of Mexican American Engineers and Scientists will meet at 11:30 a.m. Nov. 8 in the executive dining room in the Bldg. 3 cafeteria. For more information call Michael Ruiz at x38169.

# Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP2, or deliver them to the deposite box outside Rm. 181 in Bldg. 2. No phone or fax ads accepted.

## Property

Sale: Taylor Lake Estates wooded lot 90' x 135', can finance, \$39.5 obo. Don, x38039 or 333-1751.

Sale: Clear Lake Forest, 4-2.5-2, glass walled den family room, FPL, w/hi ceiling, formals, new roof & paint/carpet/paper. 326-2307.

Sale: Holly Hall townhome, 2-2.5-2, near Medical Center, security, 1649 sq ft, immediate occupancy, \$79.9k. Jack Cohen, 488-3171.

Sale/Lease: Townhouse Queens Court II, Nassau Bay, 3-2.5-2, \$975/mo or \$93.3k. Marilyn, 333-1700.

Lease: Tiki Island, house, 3-2-1, deck, boat lift, no pets, \$1.2k/mo. Phil, x30220.

Rent: Beach house, Crystal Beach, ocean view, Galveston county, furnished, sleeps 10, cable TV, wknd/wkly rates. 486-1888.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd & 61st ST, wknd/wkly/dly rates. Magdi Yassa, 333-4760 or 486-0788.

Rent: Ski condo, Winter Park, CO, 2-2, sleeps 6, hot tub/heated pool, furnished, most ski dates still available. 488-4453.

Rent: Arkansas cottage in the woods overlooking Blue Mt. Lake & Mt. Magazine, furnished, huge fireplace, antiques, \$50/dly or \$250/wkly. Corcoran, x47806 or 334-7531.

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'90 Mazda RX-7 GTU, 68k mi, red, sunroof, 5 spd, great shape, \$7.6k. x36463.

'88 Mazda PU, 83k mi, good work truck, no A/C, missing grill, \$1.7k. Chuck, x36340 or 286-1470.

'84 Toyota Camry, 163k mi, runs great, no A/C, \$1.4k. Chuck, x36340 or 286-1470.

'90 Ford Taurus, ex cond inside & out, new tires, new radio/cass, \$4.6k obo. Matt, 333-6662 or 280-425.

'85 Pontiac Bonneville, 4 dr, A/C, PW/PS, new tires/battery, 100k mi plus, runs great, \$995. Jim, x38624 or 475-9671.

'90 Dodge Caravan, 5 spd, std, runs & looks good, \$3k. Bill, 996-9820.

'86 Jeep Cherokee Laredo, 5 spd, 4WD, 4 cyl, A/C, 100 mi, AM/FM/cass, white/tan, 1 owner, ex cond, \$5.4k obo. x48541 or 538-3444.

'78 Dodge Custom van, lotsa years, lotsa miles, everything works, \$1,295. 320-2758.

'89 Mazda CabPlus truck: B220 series, red w/charcoal int, auto, A/C, chrome wheels, AM/FM/ cass, sliding back window, bedliner, new battery/ tires, \$5.8k. 482-8820.

'66 Mustang, 289, 4 spd, dual exhaust, good cond, \$2.5k. 331-9255.

'88 Jeep Wangler, 83k mi, 6 cyl, 5 spd, A/C, new soft top, ex cond, \$7.5k. 334-7143.

'86 Honda Magna 700cc, low mi, ex cond, \$2.5k. 488-6526.

'87 Benateau sailing sloop, 29' equipped for racing, 2 jibs, 2 spin, Johnson 9.9hp, VHF radio, depth, auto till, Loran, head, sleeps 4, \$14k. Ken, x31496 or 286-7583.

Sailboat, 18' Hobbie catamaran w/trailer, accessories, \$900 obo. 474-4742.

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AM/FM/cass car stereo, Infinity speakers. Dan, x36911 or 480-4203.

Canon BJC 600 color bubble jet printer, \$375. Howard, x46212.

486 DX2/66, Intel CPU, 256K Cache, 8 MB RAM, 540 MB HD, MDTower, 1.44 MB FD, 101 keyboard, mouse, 14" SVGA .28 NI monitor, 1 MB SVGA video card, \$850. 332-4466.

28.8 kbs external modem, Hayes Optima 288, new \$400 sell \$200; high speed serial card, Hayes ESP-2, \$50. Howard, x46212 or 332-2390.

Pentium 75 & 100, warranty, \$1,699/\$1,899; 286, color monitor, \$225. don, x38039 or 333-1751.

Macintosh Ilsi, 9 MB RAM, 105 MB HD, 64K byte cached memory card, 68882 FPU, 24 bit Futura-sx video card, \$1.2k; extended keyboard, \$15; 14" color monitor, \$200. Joe, x39694.

Macintosh Ilsi, 9 MB RAM, 105 MB HD, 64K byte cached memory card, 68882 FPU, 24 bit Futura-sx video card, \$1.2k; extended keyboard, \$15; 14" color monitor, \$200. Joe, x39694.

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Macintosh Ilsi, 9 MB RAM, 105 MB HD, 6



# Quality in Transition



## SR&QA director talks about quality

By Charlie Harlan

JSC is undergoing a significant and timely transition in how it approaches the quality of its products and services for spaceflight.

In February, NASA Headquarters announced that there would be an agency-wide transition from the existing NASA quality systems to the ISO-9000 series, Quality Management System. ISO-9000 standards are defined by the International Organization for Standardization and are utilized world-wide. The American National Standards Institute represents the U.S. and as such, participated in the development of the standard. Trivia item—ISO is not an acronym, rather it originates from the Greek word "ISOS" meaning equal.

The aerospace industry adopted its quality system in the late 1950's to deal with the many failures that were occurring with early generations of launch vehicles and spacecraft. It relied strongly upon inspection. NASA's implementation of quality processes has continued the inspec-

tion-oriented emphasis, and added a lot of "how to" type requirements. This is known as a compliance-based system, in that it did not focus on the desired end results of the activities. Moreover, it mostly addressed the manufacturing and hands-on work, and did not place responsibility for quality on other critical functions which had a big impact on quality. Quality cannot be inspected into a product and, therefore an inspection-oriented quality program does not deal well with the preventative aspects needed for true quality.

The ISO-9000 system is a performance-based system, meaning that the meeting of requirements—as defined by the customer—are the objective of the quality system. Furthermore, every function of the enterprise that has an impact on the quality of the products must meet the requirements. The responsibility for quality is clearly placed on senior management and the operating organizations rather than on the quality organization. The independent quality

organization becomes a technical resource and facilitator.

JSC is implementing ISO-9000 in two major ways. It has replaced the existing NASA quality system on all new procurements for which a formal quality management program is required. Some of our contractors having existing contracts are making the transition on a voluntary basis, and we are recognizing their ISO-9000 system in place of the old NASA requirements. SR&QA and the Engineering Directorate are conducting a pilot project which began in May 1994 and is planned to be complete in May 1996. This will form the template for the center-wide implementation of ISO-9000 which is planned to begin this December and end with formal certification in mid-1997. Implementing ISO-9000 at JSC will standardize the approach to quality. As a consequence, our products and services will be of higher quality and accomplished more efficiently. For more information about ISO-9000, contact Brent Fontenot at x36456.



JSC Photo By Benny Benevides

AlliedSignal's Aerospace Quality System Internal Audit team discusses quality strategies. From left are Linda Dombkowski, Don Melcher, Robert Munoz and Donna Pierce.

## Total quality management is not dead, just in transition

By Sam Boyd

Whatever happened to TQM, as in Total Quality Management?

Not too long ago many, if not most, organizations were promoting some type of quality improvement effort under the TQM banner. This movement, that produced a spate of seminars and literature flush with sage advice was regarded as the savior for efficiency, productivity, profitability and competitiveness. Now just five years later, there is little talk of TQM; there is less interest in seminars; Malcolm Baldrige applications are down 50

percent and there is less consensus on the value of TQM.

Quality managers who travel the local and national quality community, have observed that the principles and practices of TQM are still alive. Case studies show that TQM is a powerful tool for enhancing organizational performance. TQM is not dead—it's just in a transitional state in which those who found the recipe for quality management success are quietly, steadily advancing while the disillusioned have long since abandoned their efforts. TQM has essential ingredi-

ents in its recipe for a successful quality program.

The ingredients were formed from principle lessons learned. These lessons showed that leaders must be involved; meaningful empowerment is essential; useful measurements must be established; and quality must not be a separate activity. These lessons formed the basis for a broader message which constitutes ingredients of the recipe—the TQM effort must be an integral part of business operations.

There must be a business rea-

son for undertaking such an effort and that reason must be of such importance that business success is seen as dependent on changes made under the banner of TQM. Then and only then, can TQM be truly successful.

TQM is no longer a term used by many professionals. Most prefer business and quality improvement where "business" is understood to mean government, non-profit, educational, health care or industrial organizations. The recipe for success applies to all of these.

The recipe that follows is straight

forward, works and ensures integration of quality improvement and business operations. (1) Start with a list of anticipated accomplishments for the short and long-term. (2) Decide what must be done to make it happen; and (3) implement it and measure progress. While this recipe is simple, details are missing, and success hinges on executing the details, specifically those associated with the first two steps. To help with these steps, managers need some type of model that helps clarify what is really

Please see **QUALITY**, Page 4



JSC Photo By Benny Benevides

Kyson Nguyen, left, and Bobbylee Ruskis of Loral, use the scanning electron microscope in the JSC Receiving Inspection and Test Facility to evaluate wire material.

## White Sands commits to quality

By Grady McCright

One year ago this month, the White Sands Test Facility in partnership with their support contractor, AlliedSignal and its five subcontractors, embarked on the difficult journey to become ISO 9001 registered.

They chose to accomplish this challenging task within 12 short months. This certification is not for NASA or AlliedSignal. The WSTF will be registered as a single entity, a first for the international standard.

The ISO concept is fairly simple to state but tough to practice. What an organization has to do "is say what you do—do what you say—and prove you did it."

Managers at WSTF recognized that many policies, procedures and other instructional documents would require major revision, and in some cases, would have to be written for the first time. Although the path has been rough and rocky, WSTF is now scheduled for its final registration audit by mid-October.

They did not instigate ISO registration in the hope of increasing their share of the global aerospace market; but rather to better serve a diverse client base. Managers believe that the incorporation of versatile ISO standards into operations will optimize the ability to satisfy the quality policy and exceed the expectations

and needs of customers through continuous improvement in the quality they provide.

They fully expect to streamline work processes and thereby augment productivity through separation of policy documents from work instructions. This stratification will position the personnel most affected by changes to have greater influence over modifications.

The execution of ISO requirements has provided a team-building opportunity and has increased work ownership. However, changes in management style and employee acceptance of empowerment are necessary to fully benefit from the cultural shift.

In the process of implementing ISO, WSTF managers have fostered a continuous improvement culture that welcomes orderly change, encourages creativity and increases employee involvement. In addition, this venture has helped transition to a business growth mode. It has sharpened the focus on processes, and has created a continuous improvement environment.

ISO registration in and of itself is not the goal. Rather, ISO certification will serve as a voluntary function to improve business practices and product quality. ISO certification is not the finish line, it's the starting line for improving any operation.

## AlliedSignal receives ISO 9000 certification, continues quality approach

By Jim Burescia

AlliedSignal Technical Services Corporation, a member of the Space Operations Contract team, had previously transitioned its "Quality System" approach to the traditional Quality Assurance function at JSC.

Quality processes are vital since ATSC performs the maintenance, operations and hardware engineering for facilities including Mission Control Center, Software Production Facility, Integrated Training Facility, Manipulator Development Center, Shuttle Avionics Integration Laboratory, along with offsite facilities and Integrated Planning System.

The Quality Assurance approach, which had been in place at ATSC since 1986, followed the traditional concepts of "inspecting in" quality. In addition, it embedded the evaluators within the various processes to such an extent that they could not objectively evaluate activities. The evolution to the new approach required a cultur-

al change within the organization and in its relationship with its customers. This involved a two step process—the certification to ISO 9001 standards, and the adoption of a new Quality Assurance Plan.

**Step 1** -- ISO certification: In January of 1994, ATSC-Houston Operations was selected as the "pathfinder" organization within the corporation to seek full certification under ISO 9000. Formal preparation efforts began in March with the establishment of a management structure to lead an "all out" effort to ensure certification could occur prior to January 1995. The structure selected was one of "horizontal process" management which, delineated the core processes, assigned a process lead, and established cross-functional teams. The core processes were: sustaining engineering, maintenance and flight operations. These teams began the tasks of defining the processes, ensuring documentation was correct and cur-

rent and that all personnel understood and adhered to established procedures. These efforts resulted in a successful audit in December 1994, followed by full certification in January. The efforts associated with certification committed management to a major cultural change, united the organization for a common purpose, instilled discipline at all levels of the organization, identified/institutionalized metrics as process controls and proved to be a catalyst for major process improvement.

**Step 2** -- Quality Assurance Plan revision: The certification to ISO 9000 laid the foundation for multiple improvements. A primary change, that was worked in concert with customers, was that of moving the quality assurance function out of the traditional inspection mode and into audit by sampling. To transition, all members of the organization had to accept the responsibility for the "quality" of their work. The procedural discipline and organizational commitment asso-

ciated with ISO 9001 certification ensured process integrity and the quality of the product. This major change in the approach to quality assurance was approved by SR&QA in August.

The benefits derived from this transition are significant. The entire organization accepts responsibility for quality; the quality assurance resources are used to obtain the most value; and reliance on in-process and end-item inspections are reduced. The new process also requires the implementation of process evaluations and the use of statistical process controls. Key processes are now aligned with the ISO Quality System Model. In addition, customers have the added benefits of third party certification and the translation of actual process improvements, resulting in efficiency, cycle time reduction and cost savings. Visibility, on demand into all processes and processes is available, and comprehensive and accurate metrics are used to support evaluations.

# Space Center Houston offers variety for holidays

Space Center Houston will be offering a variety of activities this fall.

During the remainder of October and the first week in November, Girl Scouts can expand their universe with the help of SCH. Two stellar programs, a "Day Adventure" and "Overnight Adventure" are offered on selected dates to give Girl Scouts an out of this world experience.

The "Day Adventure" includes the SCH experience full of launches, space walks and planetary explorations. A NASA astronaut or engineer will give insight into the workings of the space program and provide encouragement to the Scouts to become future astronauts and engineers. Admission for the "Day Adventure" is \$6 for Scouts and their leaders; up to four family members may join the quest for \$7.50. "Day Adventures" will take place Oct. 28 and Nov. 4 and 5.

The "Overnight Adventure" involves special-

ized space training through the use of Lego bricks, an IMAX film, a tour of SCH and briefings from NASA engineers. Admission for the "Overnight Adventure" is \$30 for Scouts and \$12 for their leaders; the fee is inclusive of the overnight program and Saturday admission to all SCH attractions. The "Overnight Adventures" will take place Nov. 4.

SCH also will offer stellar day camps during the holiday season. All camps are geared towards an interactive experience to provide fun and educational value.

Camp activities involve exploration, research, creation construction, team work and problem solving. Holiday camps are geared for children ages 8-11 and offer a full day of activities from 8:30 a.m.-3:30 p.m. Cost is \$45 per camp per child and advanced registration is required. Discounts are available for

more than one child.

Three camps will be offered during the holiday season. "Rocket Engine-uity" will take place on Dec. 29. This camp will explore Newton's three laws of physics through rocketry activity. Campers will investigate the aerodynamics of launch vehicles while building a rocket to launch at Rocket Park.

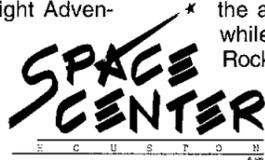
"Shuttle Orientation" will explore the orbiter from nose to tail. Campers will construct a glider, explore SCH's shuttle mock-up and find out what it takes to live in space. "Shuttle Orientation" will be held from Nov. 25 and Dec. 26.

Campers can be a special agent on an exploration mission in the "Lego Exploration" day camp. Using specific guidelines, campers will design and build exploratory vehicles with Lego building blocks. The Lego day camp will

be held on Dec. 16 and 27.

Campers can also get all dressed up and explore actual spacesuits of the astronauts during "If It Suits You" on Dec. 9 and 29. Campers will study how astronauts train, the vacuum of space and visit the Weightless Environment Training Facility.

Other activities slated for fall include "A Vision of the Future: The Art of Robert McCall." McCall's murals, paintings, illustrations and crew patch designs will be on display from Nov. 15-March 1996. "Cosmic Collisions" is a multimedia exhibition that explores the mysteries of Antarctic meteorites and impact craters, provides clues to the extinction of dinosaurs and highlights the cosmic comet crash of Shoemaker-Levy 9 with Jupiter. A "Holiday Concert Series" also is planned for the month of December. Several choir groups will perform in Space Center Plaza. For more information call 244-2148.



## Strategic plan has four goals

By Greg Williams

(Editor's note: Greg Williams is an analyst in the Office of Mission to Planet Earth at NASA Headquarters.)

To protect the global environment now and in future generations, we must build a long-term understanding of the Earth system.

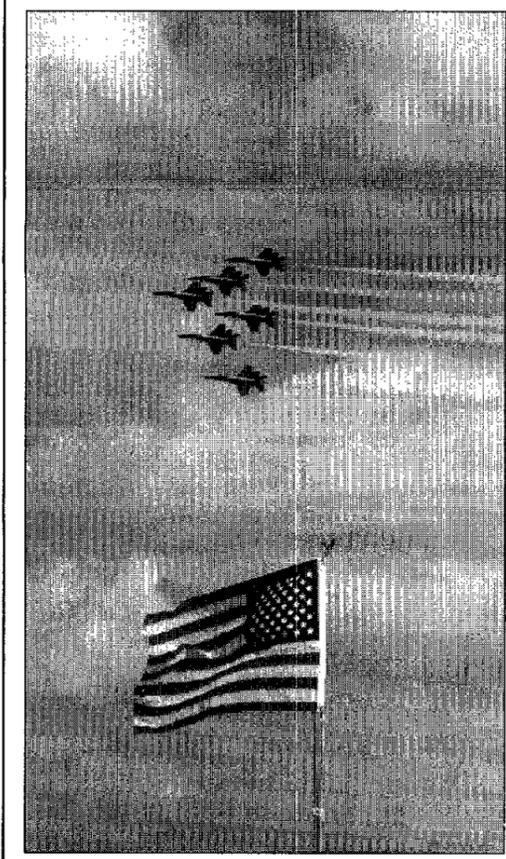
NASA's Mission to Planet Earth is working to comprehend this complex system, which includes the couplings and changes of the solid Earth, land surface, oceans, ice, atmosphere and biota. The Mission to Planet Earth strategic enterprise conducts basic research on Earth system processes which are of immense scientific importance and considerable practical value to society.

Mission to Planet Earth studies of land processes are enabling scientists to understand the rates and effects of deforestation in the Amazon. This research may also lead to a host of applications for farmers, foresters, urban planners and natural disaster response managers. The Landsat 7 and EOS-AM1 spacecraft will provide global coverage with resolutions fine enough for a wide variety of research and economic uses.

The Mission to Planet Earth program can be viewed in interrelated pieces. Its research and analysis program provides the intellectual foundation for Earth system science. It also employs aircraft and balloon campaigns and field observations. Early Earth observation missions, such as the Upper Atmosphere Research Satellite and the shuttle-based Space Radar Laboratory, are returning data on critical Earth sciences questions.

The Earth Observing System program, beginning with the EOS-AM1 launch in 1998, will kick off the true study of global climate change. For the first time, humankind will be able to form a globally integrated picture of land, sea and ocean interactions.

The Mission to Planet Earth's strategic enterprise plan has four major goals: increase understanding of the Earth as an integrated environmental system and of its vulnerability to natural variations and human influences; observe and characterize the entire Earth system and make the resulting research data widely available; contribute to wise and timely national and international environmental policy; and foster the development of an informed and environmentally aware public. The Goddard Space Flight Center leads the Mission to Planet Earth program. NASA also collaborates with other agencies whose work involves Earth research, including the National Oceanic and Atmospheric Administration, the Department of Interior's U.S. Geological Survey, the Environmental Protection Agency, the National Science Foundation and others. Because global change research is an inherently international endeavor, NASA has over 60 significant agreements with more than 20 other countries. Today's program is laying the foundation for an ability to understand and predict global and regional Earth system processes.



**TORA TORA—** It may seem like Pearl Harbor all over again, but it's only a reenactment that took place at Ellington Field last weekend during the annual Air Show. Top: Recondition WWII Japanese and American fighter planes bomb runways as military personnel try to fight back in a reproduction of the actual occurrence in Hawaii. Left: The Blue Angels fly in formation over Ellington Field to the delight of the crowds.

Photos by Brian Zemba

## Thrift Savings Plan begins open season next month

Open season for the Thrift Savings Plan begin Nov. 15, so it's time for employees to start thinking about whether they need to make any changes to their contributions.

Until Jan. 31, eligible employees may begin contributing, change their contribution amounts, change the allocation of their contributions among the available investment funds, end contributions or waive enrollment. The effective date for changes depends on when the election form is received by benefits specialists.

When employees adjust how they want their retirement savings account funds invested, the changes

apply to all contributions in the account, whether they are employee, agency automatic or agency-matching. Federal Employee Retirement System employees not making contributions may still elect to invest all or any portion of their agency automatic contributions in any of the funds.

JSC's Human Resources Office will be sending out open season updates.

A plan summary and TSP-1 election form may be obtained from the Employee Services Section, AHZ Bldg. 45, Rm. 140, which is where completed forms should be sent. For more information, call x32681.

## Quality improvement now is becoming competitive edge

(Continued from Page 3)

important to the business; what the key drivers are; which actions are most critical; and in what order things should be done. A model with a proven track record does exist.

The Malcolm Baldrige National Award is the best example of a success-oriented, criteria-based model. This model is a product of the early quality efforts of Miliken, Ford, Motorola, Xerox and others in the U.S. who relied upon the works of quality gurus and the Japanese. Baldrige is a model applicable to any enterprise. Baldrige criteria prescribe what needs to be done, and research data is available to prioritize what needs to be done.

Most importantly, being a business model, Baldrige is a quality tool and forces the integration of quality. Baldrige mandates the identification of the single-most critical element and a reason for beginning in the first place. Reasons may include profitability, market share, retain customers or for government, costs or efficiency and productivity.

Quality improvement efforts forced into the mainstream of organizations for business reasons seldom fail. Success stories abound, and more stories will be added this month when the 1995 Baldrige winners are announced. More and more businesses are finding that quality improvement efforts do pay, and more are coming to understand that while today quality is a competitive advantage, tomorrow it will be the price of admission.

Although essential, quality alone cannot ensure long-term growth. Research results suggest that present models need to be augmented with long-term, growth-oriented criteria. This research is one step to quality improvement followed by others such as cycle-time improvement, product innovation, redefinition of industries and even creation of new industries. This evolution is manifested in the current, dramatic changes the world is witnessing in such industries as telecommunications and computing, from which new products and new customer services are emerging.

## Scientists say Galileo's objectives can still be reached

(Continued from Page 1)

and electrical failures in the recorder that could explain this problem. Our efforts last week and in coming days will help us determine whether the recorder can be restored to operation."

Commands were radioed to the spacecraft to play back a small sample of data stored on the tape recorder. The tape-recorded data, along with engineering data reporting on the recorder's performance, was first stored in memory located in Galileo's central data subsystem, then transmitted to the receiving stations of NASA's Deep Space Network.

"Successful commanding of the device would still mean additional assessment and troubleshooting," said O'Neil. "Work concurrently continues on a backup plan to preserve the return of imaging and spectral data in the event the tape recorder cannot be used."

Galileo's tape recorder and the spacecraft's guidance control computer were called into service as data compression and storage links, in a sophisticated alternative method devised to maximize data return from Jupiter after Galileo's main high-gain antenna failed to open properly. Loss of the high-gain antenna meant that all spacecraft communications must be conducted at much lower data rates through a low-gain antenna.

New techniques have been developed to edit, compress and encode Galileo's data, including images, in the spacecraft's computers, then store that data for playback to Earth. Additionally, new hardware and software changes at ground receiving stations have been installed to further increase the amount of data transmitted from Galileo's low-gain antenna.

Project Scientist Dr. Torrence Johnson of JPL reports that at least

50 percent of the mission's original science objectives could still be achieved if the tape recorder is found not to be working.

"The impact of a possible loss of the tape recorder is not as bad as people assumed when we first heard about the problem," said Johnson. "Even without the recorder, we have an exciting mission that allows us to address all our primary objectives. Although the total number of pictures and spectra we receive would be lower than with a tape recorder, we would still have enough to do the job."

According to Johnson, among the mission's three major areas of science investigations, it is the data return from remote sensing instruments such as cameras and spectrometers that would be impacted most by loss of the tape recorder. Data from these instruments can be saved by re-routing them directly to memory areas in the flight computer.

"The mission will still study all aspects of the Jovian system—Jupiter's atmosphere, its moons and its magnetic environment—and we plan to make a majority of the scientific measurements that had already been planned," said Johnson.

One hundred percent of the atmospheric probe's science objectives can be achieved without the tape recorder, in addition to all of the Galileo orbiter's survey of the Jovian magnetic and charged-particle environment, Johnson said.

"The principal loss of data, if the tape recorder is not usable, would be the number of images and other high-rate spectral data that could be returned by the spacecraft," said Johnson.

Galileo spacecraft and software engineers, however, are devising new backup methods to store imaging and spectral data in available memory areas within the spacecraft's central data processor.